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To stimulate innovation and the modification of instructional practices as well as to encourage discussion and experimentation aimed at the development of theories about the process of change, some of the new techniques and practices in use at a few colleges and universities are discussed and mechanisms are suggested for generating change. Innovative techniques include the use of television and other audiovisual media, flexible class scheduling, new grading methods, interdisciplinary courses, independent study, and cooperative work programs. In order to introduce new techniques successfully, it is essential to convince the faculty of the need for change. This can be done through faculty workshops and orientation sessions, manipulation of the traditional systems of rewards, prerogatives, and perquisites, and by involving the most respected and influential faculty members in the process of change. Strong administrative leadership and interest are critical for successfully engineering change in the instructional process. (AM)

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Innovation in Collegiate Instruction:
STRATEGIES FOR CHANGE

SREB RESEARCH MONOGRAPH NUMBER 13 □ BY LEWIS B. MAYHEW

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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The cover symbol is an interrobang, the first punctuation mark to enter the printed language since the quotation mark was introduced in the late 1600's.

An innovation itself, the interrobang aptly expresses the imperative and uncertainty of change.

Innovation in Collegiate Instruction:
STRATEGIES FOR CHANGE

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SOUTHERN REGIONAL EDUCATION BOARD / 130 SIXTH ST., N. W. / ATLANTA, GA. 30313

Foreword

Improving the quality of the educational experience is a constant goal of our colleges and universities. Recent incidents of student unrest, however, have ushered in an era of urgent concern about undergraduate education. Institutions have been forced to examine curricula, question their relevance to the demands of contemporary society, and search for better ways to teach today's students.

In this monograph, Professor Mayhew discusses the need for innovation in college teaching and describes some experiments with new methods that have been judged successful. He also makes definite suggestions for motivating change.

This monograph provides a valuable resource for the improvement of higher educational programs. It expresses another dimension of the Southern Regional Education Board's continuing interest in this area.

WINFRED L. GODWIN,
Director
Southern Regional Education Board

Preface

This essay is an attempt to suggest some techniques by which colleges and universities can stimulate experimentation, innovation and the modification of instructional practice. It also is an attempt to stimulate discussion and experimentation aimed at the development of theories about the process of change.

While it is the work of one author, it was sparked by a small conference of collegiate officers interested in innovation which was called by the Southern Regional Education Board. The conference was held in Gatlinburg, Tennessee, in the spring of 1966 and consisted of three days of intensive discussion of thoughts and experiences in bringing about change in an academic community. The tape-recorded conversations became the basis for thinking about this essay as well as a prime source for some of the examples cited. Indeed, without that conference there could not have been this first effort to explore a few tentative principles.

Several points of considerable significance emerged during the course of pondering the Gatlinburg experience. The first is the critical role a "sociological stranger" or outside consultant can serve in bringing about change. Coupled with this, however, is the problem that there are relatively few people with the broad clinical experience of working with many institutions who are available to fill this role. Second, the often-mentioned significance of the president in the life of a college was again emphasized. It is almost an axiom that if the administration is not interested in innovation, there will likely be none.

Lastly, one is struck by just how rich the resources for innovation are and how poor the yield in actual accomplishment. It is to somehow increase this yield that this monograph is presented.

LEWIS B. MAYHEW

Stanford University
December, 1967

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chapter 1

The Paradox

The practice of higher education in the United States in modern times is a major paradox. It is conducted in a society experiencing perhaps the most revolutionary changes in the history of mankind. Changes in medicine from the administration of antibiotics to the widespread use of organ transplants have altered the whole conception of health. Changes in transportation, communications, agriculture, production and, of course, scholarship, have come with such rapidity that society has scarcely been able to adjust to them. Yet the processes and practices of college education do not seem to have changed appreciably since the middle of the nineteenth century when the recitation technique, developed for a prescribed classical curriculum, gave way to the adoption of the lecture, laboratory and seminar methods of instruction derived from the German universities and suited for mature students in a research-oriented situation. Now, one point of view could—and one suspects, does—hold that the practices of higher education have been so effective that there is little reason to change them. But this scarcely is consistent with the entire social stance that change and improvement are possible. Further, it is not consistent with views and observations concerning teaching.

Nowhere is the paradox of collegiate education more starkly revealed than in an examination of college teaching as it seems to be, ideally and in reality. College teachers see themselves, if one can believe what they say in essays, as being a mixture of virtues. To one professor the teacher becomes almost the personification of his subject.

> It is his subject; he spends his life thinking about it, whether in or out of class; it is his second if not his first nature; it is what gives him joy. No student ever fails to be aware of this . . . . The truly personal teacher is the most responsible to his subject. Because he knows it to be more important than himself, he is humble in its presence and would rather die than misrepresent

it. It existed before him, and will exist after him; its life is long, though his is short. But if his life is to mean anything it must mean something in connection with his subject; and it had better mean that he has come to understand it as good persons before him have understood it.[1]

Another professor sees things in a somewhat different light.

> Our task is to transform young, promising human beings into constructive, creative personalities who have realized themselves, who build their potentialities and achieve maturity as full as possible. The transformation of individual students into constructive creative personalities is the end of teaching. Our work should focus on the student rather than on our discipline. On the student as a real flesh and blood, total human being there before us; on the student as an individual.[2]

But still another professor sees research involved.

> The history of science is full of examples of great and small discoveries made by old and young scientists who have been looking for something. College teaching offers a wonderful opportunity to play this game of 'seek and find.' There are many problems that have puzzled scientists for many years. Goethe summed this all up when he said, 'The greatest happiness that can come to a scientist is to explain the explainable and to patiently admire the inscrutable.' Each new generation of young scientists gets its happiness by explaning in part what was inscrutable to the previous generation.[3]

From such opinions can be etched the picture of the college professor as the kindly mentor of youth who constantly brings to the young the fresh insights that flow from his own scholarship, which he pursues in quiet contemplation. He is a thinking man who, by the virtues of his own life, serves as a model with which the best impulses of youth can identify. While on occasion he can be stern with students, it is always a sternness for growth, never for vindictive reasons.

There is considerable substance to support this picture. There is the record of one distinguished professor who declined three presidencies and wrote but little so that he could remain with his students. Louis Agassiz could, by forcing students to attend to the detail of a dead fish, develop perceptive scientists. John Dewey, by the force of his own intellect, displayed in the lecture room,

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[1]Mark Van Doren, "The Good Teacher," *College and University Teaching*, ed. H. A. Estrin and D. M. Goode (Dubuque, Iowa: William C. Brown, 1964), p. 40.

[2]Unpublished letter to the author.

[3]Reuben G. Gustavson, "Discoveries Through Research," *College Teaching as a Career,* American Council on Education, pamphlet prepared by the Committee on College Teaching (Washington: American Council on Education, 1958), p. 11.

modified the thinking of a generation which could then revolutionize the schools. And, of course, Mark Hopkins not only molded the thinking of those who came in contact with him, but became the proof that his ideals of teaching could be realized.

This ideal vision, rooted though it might be in some reality, must be compared with another reality somewhat more spotted in character. Teachers generally are not really very important in the lives of students. Several thousand students in a social science course at Michigan State completing an open-end questionnaire concerning important educational influences rarely if ever, mentioned the teacher. Antioch College is generally regarded as an institution which has high impact on students. Yet, seniors there placed teaching and the curriculum quite low among the factors which influenced them during their collegiate years. At the University of Tennessee, several studies of students learning without class attendance suggested that in some courses students tend to learn more by staying away from class than by having classroom contact with the teacher. After visiting 80 different classes in 19 selected colleges and universities, Dressel and Mayhew [4] concluded that, with a few notable exceptions, classes and courses in general education were routine lecture presentations of materials already available in textbooks, and that students did not appear to be particularly interested in what was being said. This lack of interest would typically be manifested by letter-writing, sleeping and reading from other textbooks during the lecture. Students' comments about teachers, obtained by this writer from six different colleges during the past two years, also lead to this conclusion. Typical of student reactions are such statements as:

"Teachers bore students with personal reminiscences, particularly of World War II experiences."

"Teachers assign Mickey Mouse busy work."

"While a few teachers meet student expectations, most do not and should be avoided."

"Teachers cover the textbook in class, which seems a waste of time."

"It is a myth that teachers like to be with students. They usually meet their classes, have coffee with other teachers and then go home."

"Teachers know their subjects, indeed, are usually national authorities. Yet, they cannot seem to communicate to students."

A group of cadet teachers was forced to critically observe experienced teachers in a variety of types of institutions. They reported similar reactions. Typical examples of what they re-

[4] Paul Dressel and Lewis B. Mayhew, *General Education: Exploration in Evaluation.* Washington, D. C. American Council on Education, 1954.

ported about teachers when told to observe, but not given guidelines or criteria to follow, were:

"Preoccupation with personal illustration."
"Reading lecture notes."
"Reading from the textbook."
"Poor word selection."
"Disturbing mannerisms."
"Using arms rather than the blackboard to show a diagram."
"Abdication of control of the class in the face of a two-student debate."

Of course, there were some bright spots reported. One lecturer held a class spellbound for a full hour; another criticized student themes before the entire class without being hurtful even to those students whose papers were given grades of "F"; and another presented a well-organized lecture which left the students feeling they had heard a high order of conversation. But, of forty-five incidents reported spontaneously after observation, the large majority were severely criticized.

Further evidence on this matter of the spotted reality is presented by some elements of the recent student protest movements. While many of the objects of student protest have to do with regulation of their private lives, or the large moral dilemmas perplexing the entire society, some of the criticism about collegiate education focuses on the kind of teaching students receive. Some students perceive the university to be a knowledge factory, forcing students either into large impersonal lectures or into discussion groups at the mercy of aspirant doctoral candidates, more preoccupied with the progress of their dissertations than the educational needs of students.

In the light of such evidence, the question naturally arises as to why college teaching isn't changed, why professors don't do something to improve the situation. There seem to be a number of reasons, the most important of which is probably inertia. It is simply too difficult to change; it is much easier for a professor to use an already prepared lecture than to contrive new approaches. It is much easier to fall into an historically established pattern of classroom contact than to establish in behavioral terms the precise objectives of a course, or class, or other learning situation.

A second barrier is the way in which the reward system operates in higher education. Although institutions claim in their catalogs —and their presidents in their public speeches—that teaching is a primary responsibility of collegiate institutions, the reward system does not support this contention. This is especially true in four-year institutions, which generally claim to value a merit system for promotion, tenure and salary increase purposes. Teach-

ing is rarely considered except in the most haphazard and general way. Rather, those things are considered which can most easily be quantified. Seemingly, something that can be counted, even at a very gross level, provides greater security than an attempt to ponder and assess such intangible things as classroom performance. Rewards are based on the quantification of such things as the number of community service efforts, the number of offices held in national societies, the number of books or articles published, the number and size of research grants, the number of off-campus consultations, and the number of research projects in progress. None of these has but the most tangential relationship to teaching. Further, even the quantification of these factors takes place at a gross and superficial level. For example, generally those who must judge simply count, without ever reading, the research publications which the professor is supposed to have prepared.

A third barrier operates because so very little is really known about successful teaching. Even those who spend their lives thinking about successful teaching aren't very convincing in attempting to prove that they know what they are saying. Generalizations are simply not supported by good evidence; they become matters of opinion supported by rhetoric and logic. To the disbeliever this rhetoric isn't very convincing. One educational psychologist, Ernest Hilgard, made a pessimistic point when he observed that:

> Really, considering all the research which psychologists and educational psychologists have produced, there is precious little which has any relevance telling us how to do better this act of teaching. Outside of a few things, such as the laws of recency and primacy, and some notions of the value of reward and reinforcement, there are precious few things which the experimental psychologists have shown us which have relevance for how we conduct a class.[5]

This being so, and with so many of the experiments which do attempt to examine the dynamics of college teaching showing no significant differences, the person who says, "If there are no significant differences, why rock the boat?," has powerful support. Of course, there is another stance one can take. Hilgard himself takes this, saying that since typically in our experiments we come up with no significant differences, we can be reasonably sure that even with experimentation students are not likely to be hurt significantly.[6] And it's just possible that out of some experiments will come an approach which will reveal differences of genuine significance as well as statistical validity.

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[5]Ernest R. Hilgard, Paper delivered at the Fall Faculty Conference, Stephens College, Columbia, Missouri. September 1965.

[6]*Ibid.*

A fourth barrier to change in teaching practice involves a definite conflict of roles. Perhaps the biggest single problem which American higher education has faced in the last hundred years, and has so far failed to resolve, is the conflict between the research role of the university and its teaching and service functions. In the United States, the contemporary complex institution reflects a marriage between the English-style undergraduate college and the German-style research university. There is the attempt to use the same faculty for both functions, and professors have struggled and are struggling to resolve the resultant role conflict. The role conflict, it should be observed, is real even in those institutions where there is no validity to the conflict. Specifically, there are perhaps 1,200 to 1,500 institutions in this country in which the "publish or perish" policy is just not applicable, and where it is nonsense to talk about such a matter. Yet in those small liberal arts colleges, the junior colleges, and the primarily teacher-preparing institutions, faculties still act as though "publish or perish" were a reality. The explanation probably lies in the enormous influence which the major universities have over the character of higher education and the fact that teachers in other sorts of institutions undoubtedly took at least some of their graduate work in institutions in which the role conflict between researcher and teacher was real.

Related, of course, is the fact that the product of a graduate school doesn't really know how to teach, nor is he prepared for teaching as an essential function. While some will have had experience as a teaching assistant, this is a routine sort of dealing with sections after the manner of the major professor. The majority will not have had even that limited exposure. And the role model which the recent graduate has is the major professor whose first interests lie with his research and who regards teaching as the chore necessary to allow him his research time. The power of the major professor in graduate school as a role model has never really been studied, but is illustrated by two middle-aged professors serving at different universities. They were not at all physically similar, but they had a pronounced resemblance to each other. Their speech, mannerisms, vocabulary and even gait were alike. The explanation was that both had studied under a distinguished historian at the University of Michigan years before, and both had adopted their professor's style.

A fifth barrier to innovation or change is the fact that other changes have come about so rapidly. Currently, institutions of higher education face problems which ten years earlier were not problems. This can be exemplified in many different ways. To take just one example, consider the private liberal arts college in

which teaching is supposed to be the major preoccupation. There are approximately 850 institutions of this sort which, up until the middle 1950's, were quite small, uncomplex institutions in which educational leadership could derive directly from the president. But consider what has happened. In a scant eight to ten years, an institution previously having 500 to 600 students, an operating budget of less than one million dollars, a physical plant which had experienced no additions for 50 years, and a president who could know personally every student and faculty member on campus, has grown to one of 1,200 to 1,500 students. The faculty has doubled in size, the operating budget is now over four million, new buildings are being constructed at the rate of a quarter million dollars' worth a year, and the president is on the road most of the time securing necessary funds and support for an ever-increasingly costly educational enterprise. In the mid-1950's, the institution could get along quite nicely without an academic dean. Currently, the president is perplexed as to why he can no longer exert educational leadership. This matter of change within collegiate institutions is so enormous that it should be elaborated still further. There is considerable glib talk today about the problems of the highly selective institution. Harvard College currently will accept one out of nine students who apply and is in a position where it could, if it wished, accept only the upper one percent of the high school graduating classes. This is only a recent phenomenon, however. In the early 1950's, Harvard was accepting one out of three students who applied. Or consider the developing state institutions such as the New England state universities. Up until the end of the 1950's these institutions were primarily concerned with teacher preparation, some work in agriculture, and engineering for undergraduates. Within just ten years, the missions of these institutions have been changed, and they find themselves struggling to accommodate enrollment increases of several thousand each year, induction of new faculty at a rate of 200 to 300 each year, and change of character from relatively single-purpose institutions to full multiversity status. To exert strong leadership for change in the process of education in the face of these other institutionalized changes probably requires creating new kinds of leaders. But as John Gardner pointed out in his concluding report as president of the Carnegie Corporation, society is not training leaders. It is clearly demonstrable that society has not trained people to carry on some of the specialized functions in increasingly complex institutions. The role of director of institutional research is a case in point. Institutional research is a new technique designed to improve collegiate management. The concept itself, in any widespread

sense, is only about ten years old. Colleges and universities have simply not trained technically competent people to do the tasks inherent in the concept of institutional research.

Even if there were leaders who could generate innovation and change in teaching, little is really known about how to do such things as provide adequate in-service training for faculties. There are, of course, a number of techniques which have been attempted. There are faculty seminars, libraries of pedagogical materials, fall faculty conferences and the like. Yet there is little evidence that any of the techniques generally used to improve faculty teaching have any real validity.

Still another barrier is the breakdown of communication between people, particularly as institutions become more complex. Existing channels become clogged very quickly, and there seems to be a reluctance on the part of people, particularly administrators, to make overt efforts to unclog channels of communication. Barriers which interfere with communication, resulting from bureaucratic structure, are of course intensified by the differences in the several academic disciplines. There probably are on the collegiate campus not just two cultures but several hundred, and these several hundred cultures find it difficult to communicate one with the other.

Another barrier is the confusion regarding types of institutions. As one thinks about college education, there is an inclination to generalize about the enterprise as though all institutions were quite similar. There is some reason to believe that institutions are becoming more like each other; that is, complex, multi-purpose institutions. Technical institutes such as M.I.T., Carnegie Tech and Cal Tech have become comprehensive universities by adding large increments of the humanities and social sciences. Former teachers' colleges have added liberal arts, business and graduate work. Liberal arts colleges have also become complex by adding teacher education, business and home economics—and one college has even added agriculture. Even junior colleges seem to follow this pattern of regression toward a mean. But there are still fundamental differences. Recall that there are approximately 2,200 institutions of higher education in this country, of which 800 are two-year institutions making no pretensions at having a research function. Then there are something on the order of 850 single-purpose, liberal arts colleges. With the exception of a very small number, perhaps 30 to 50 at the most, these institutions make no pretensions of forcing faculties to engage in research. Yet, in most of these institutions there is a tendency for people to excuse themselves from not being creative teachers on the ground that they need to pursue their own re-

search. Paul Woodring demonstrated the ridiculousness of such an excuse by pointing out that if every faculty person in the country produced an article each year, the number of learned journals would have to be increased by 10,000. If every faculty person produced a book every five years, the number of publishers would have to be doubled. The barrier is exemplified by the young assistant professor who remarked that he would just as soon not be regarded as a scintillating or brilliant teacher; that would allow at least the presumption that he was a brilliant researcher.

The last barrier to innovation or change in teaching is the academic conscience. It is possible to argue that regardless of specific religious denominations to which American professors give allegiance, there is a strong vein of Calvinism in most of them. There is a strong feeling on the part of professors that a certain number of hours must be put in on the job each week. There is the argument that the committee system is really a salve to the Calvinistic conscience of the college professor. He puts in his classroom time during the morning, which can be a drain if he has to talk to 400 or 500 students. Ideally, in the afternoon he should spend his time thinking, reading, just loafing or doing something else. But such activities, rejuvenating though they may be, are not really work in the Calvinistic sense, and so a committee is the ideal substitute. In a committee one doesn't have to think, but one is required to be present and to go through the motions of work.

These barriers to change—and the list, of course, could be elaborated still further—have become so obstinate that some institutions have begun to experiment by actually institutionalizing change agents. Some institutions are really trying to create the equivalent of what one theorist called "Vice-President for Heresy," and of course much of the effort of the United States Office of Education and some of the foundations, such as the Danforth Foundation, are directed toward bringing about change in the practice of education. Increasingly there is acceptance of the belief that education is an important tool of national policy which should be used to solve some of the more vexing domestic problems. Yet, there is also the awareness that education as it has been practiced in the past is probably not effective. Even a gross organization for learning might work with a student population which comes, for the most part, from middle- and upper-class homes, having had experience with books and other artifacts from infancy. But to solve the problems of educating the culturally disadvantaged into the ways of a complex society, whether those disadvantaged be Negroes in the larger northern cities, poor

whites from Appalachia, small farmers from the backwoods of Maine, Indians in New Mexico, or Puerto Ricans in New York City, requires different and more refined techniques than education has thus far used. One of the responses of the federal government has been the creation of research and development centers, all seeking new ways of teaching which will be most relevant to the massive educational needs of contemporary society, and adaptable to the expanding technology.

The problem of innovation and change demands effort along several fronts. There must of course be basic research regarding the nature of education and applied research to find means of educating. But there must also be dissemination of information or techniques which are currently known and experimentation with ways of gaining faculty acceptance of relevant new techniques. Without minimizing the values of research, this essay will deal with the development part of research and development. That is, what is now known and what can be done about it.

chapter 2

Innovation—Possibility and Potentiality

If one had sampled typical college campuses in the 1930's, particularly the parts concerned with undergraduate education, one would have found a relatively limited and common pattern of practices. Students entered as freshmen and expected to finish the bachelor's degree at the end of four years—whether they actually did or not. Each of the four academic years was divided typically into two semesters, although in perhaps a fourth of the nation's colleges and universities that same nine-month academic year was divided into three quarters. Students would normally take four or five courses each semester. These would meet in formal classrooms three or four hours a week, except for instruction in foreign languages, which would normally meet every day of the week, and instruction in laboratory science, which would provide time for students to do experiments described in considerable detail in their laboratory notebooks. The prevailing mode of instruction was a lecture or lecturette regardless of whether the class was relatively large (200 to 400 students) or relatively small (10 to 15 students). In large universities big classes would be organized with one or two lectures per week, followed by discussion sections frequently led by young instructors without the Ph.D., or by a limited number of graduate assistants. Students were expected to study two hours each week for every hour of credit, but it was unusual if they did half that much work. Students were assessed by means of a mid-term examination and a final examination, with an occasional book report or term paper required. The requirements for a bachelor's degree were a certain number of semester hours or quarter hours of credit, and sometimes courses in each of two or three major domains of knowledge. Occasionally, in some of the science courses, slides of natural phenomena would be shown, and once in a great while a particularly relevant motion picture would be displayed during class time. The blackboard was the most frequently used visual

aid, but again, with the exception of mathematics, was not typically used, and, when it was, the instructor's hieroglyphics—which he called handwriting—made the resultant listing of words, taxonomies or diagrams all but completely unintelligible.

If one were to make a similar sampling in the mid-1960's of college campuses across the United States, one would, with some quite interesting and notable exceptions, find that higher education is being practiced in substantially the same way. A class in French begins with student singing of a simple French song. This is followed by individual student translation of sentences from French to English, and English to French; then a short period of dictation, ending with a few students reading in French from a French reader. A class in the history of civilization is organized with a major professor giving one or two lectures to a large group each week, followed by discussion sections, in many respects just smaller copies of the large lecture, led by junior faculty or graduate assistants. Students still spend additional time in laboratory science courses, but continue to receive less credit for the time spent in laboratory than for the time spent in the equal tranquillity of listening to a lecture. Smaller classes labeled "discussion" continue better to exemplify a lecturette—a less well-organized lecture with one or two questions being asked—than they do a genuine group effort at solving problems. The academic year still begins in September and still ends in late May or early June, and again, whether students actually do or not, the vast majority intend at the time they begin their college work to finish college in four years with a bachelor's degree. There has been an added element, of course. Students in a number of institutions expect, almost as a matter of manifest destiny, that they will "go on to graduate school." Actually, however, a visitor from Mars walking down the hallway of a classroom building at the University of Illinois in 1935 would have found instruction going on very much as it would along the hallways in academic buildings at Stanford University in 1967. The hallways of Morgan Park Junior College in the 1930's would have revealed substantially the same sounds and demonstrated the same student and teacher behavior which one can find in Foothill College in 1967.

Now, some can and do claim that such commonalities are to be expected and reveal, among other things, the universal and timeless character of education. After all, education in the 1930's dealt with people, as does education in the 1960's. Colleges and universities in the 1930's did produce the men and women who manned the greatest army the world had ever seen, the men and women who brought about revolutionary new practices in

medicine, the men and women who made the American productive enterprise function at a higher rate than the productive efforts of any other nation, and the men and women who are doing much to maintain a high level of affluence while at the same time attempting to rectify some of the worst social abuses. If that system of education worked, is there any real reason to change it?

But another point of view holds that even if it could be established that college teaching in the 1930's was perfectly appropriate for the objectives and missions of higher education, change is still required in practice because higher education in the 1960's is required to do so much more than colleges and universities have ever had to do in the past. Such an argument would list a number of new problems for which the older, more comfortable style of teaching and learning may be simply inappropriate.

There is first of all the problem of attempting to provide some education for an entire population and to provide some post-high school education for a vast majority of a population, perhaps as much as 80 percent of a college-age group. Within this group are those with such marginal cultural backgrounds as to be unfit to profit from such techniques as the formal lecture. Higher education in the 1930's didn't really need to concern itself with changing fundamental self-images of large numbers of clients. Yet, as it attempts to achieve educational goals with hundreds of thousands of Negroes and Puerto Ricans, a prior step must be to help these students overcome images of themselves as being inferior and a breed apart from the majority of the population.

Although conditions were beginning to change in the 1930's, those who attended college generally expected to receive their bachelor's degree in business, or education, or agriculture, and then to spend the rest of their working lives in that profession. In the 1960's the vast majority of people receiving a bachelor's degree must seriously anticipate changing radically the nature of their jobs perhaps four, five or six times during their working lifetimes. Each change will require new skills which frequently can best be developed by colleges. The techniques of instruction which worked for 16 to 18-year-old children of the 1930's middle classes are proving inadequate for the needs of the young man of 30 who has been a practicing engineer for seven years and who now must acquire new skills of business management.

While a proliferation of knowledge was beginning to take place in the 1930's, there was a relatively limited number of subjects, each possessing a logic of its own. The logic of history, political science, and economics was largely descriptive; the sciences were typically represented in the curriculum by taxonomic botany and zoology, chemistry, and physics; and engineering

concerned itself with relatively straightforward problems of bridge and highway construction, steel fabrication and the like. The approaches and logics of these subjects were relatively well-known and understood, but in the 1960's one sees a flourishing of new hyphenated subjects, attempting to bring together several logics which were previously judged irrelevant one for the other, if not incompatible. The pedagogical problems of teaching a sequence in bio-engineering or chemical physics or psychological economics increasingly appear to require new ways of presenting materials, new ways of comprehending large amounts of materials and, indeed, new epistemologies.

Again, in the 1930's Oriental and non-western lands were rarely thought of, except by the "old China hands." Europe was far away, but who ever heard of the multitude of little nations in the Middle East? The cultural load of the college curriculum could be Western European and North American in orientation. Foreign languages were all basically Greek in origin, and lessons in geography were quite circumscribed. Since those days, revolutionary changes in communication and transportation have made the world shrink. The revolution of colonial peoples has faced the nation with new and perplexing tasks, and the schools with the requirement to teach new and exotic languages, ideologies and cultures. It is becoming increasingly obvious that the methods used for teaching French, with its heavy load of cognate words similar to those in English, will not suffice to teach the Vietnamese language.

The amount of knowledge of all sorts is increasing at such a rate that it is no longer possible to provide a balanced curriculum intended to at least outline dimensions of human knowledge.

Education in the 1930's was supported principally by faculty members who received quite inadequate salaries for their services, which they tolerated because college teaching was a comfortable existence. Endowments and reasonably limited state appropriations made up the bulk of the income of colleges and universities. During the 1930's, with the exception of a few institutions such as Yale or the University of Chicago, relatively little building was taking place, and colleges and universities could maintain a poverty level solvency within which the prevailing modes of instruction did not seem to be extravagant. In the 1960's, however, the philanthropy of college teachers has virtually disappeared. The cost of new buildings is causing states and institutions to waver at the numbers of students wanting an education. Increases each year in total educational cost are at rates which some have feared might inundate the entire enterprise. In such a context, it has become apparent that older methods

of instruction might be too great an extravagance for even a wealthy nation such as the United States.

It is factors like these which seem to commend to colleges and universities the need to innovate and to change. Now such an injunction would be relatively meaningless if there were no new practices and techniques available to be adapted to the educational mission of higher education. But there are innovations available; there is a rapidly expanding technology which has produced equipment having educational potential; and there are new theories about better ways of helping people to learn. While the purpose of this monograph is to suggest ways by which innovation and change can be engineered, a prior step must be to determine what sorts of activities are available which college teachers might be persuaded to use.

A few institutions and teachers, reinforced by some limited research, are beginning to feel that students do not necessarily need to be in a classroom engaging in some formal kind of instruction to learn even quite difficult subjects. It is becoming apparent that independent study for students at all levels of collegiate education has real potentiality, not only for tailoring collegiate education to an individual student's needs, but as a means of extending the influence of significant professors. The term "independent study" does not refer to the tutorial system which has been in vogue for over a century at Oxford and Cambridge. Rather, it refers to a student selecting a field of study or a particular project, receiving some guidance with respect to procedure from a faculty member, and then working on his own. An early formulation of this, of course, was the comprehensive examination system at the University of Chicago which allowed students to study on their own and then receive academic credit on the basis of an externally prepared examination. But there are other more recent examples of independent study. Florida Presbyterian College freshmen have a period of independent study between the fall and spring terms. Ultimately, that college plans to have as many as 50 percent of its students take the bulk of their four-year collegiate work by such a technique. It can be found at the graduate level, with students taking two or three methodology courses and then working on their own to broaden their understanding of a subject and develop a research project. Also, it can be allowing students to study the logic portion of a philosophy course during an intensive three or four-week period of independent study. This was done in the House Plan Experiment of Stephens College. No formal instruction in logic was given. While an earlier inquiry suggested that independent study was enormously costly, the concept elaborated here need not be

exorbitantly priced. The professor is expected to give some reinforcement and some evaluation of the student's efforts, but the student himself is expected to fashion his work in the subject in ways which are most consistent with his own personality and needs.

Technology has produced an amazing array of goods which seem to have considerable educational potentiality. Television is the most obvious. Through open-circuit educational television, Wright Junior College in Chicago can offer credit courses to thousands of people in the Chicago area, requiring that the student come to the campus just twice, once to register and once to take a final examination—though even a final examination can be given over television, as an experiment at the University of South Florida established. At Stephens College a closed-circuit television system enables a prescribed course to be taught to an entire freshman class at the same time, with no class having more than 18 students. And at Stanford University, television has been found to be an admirable way by which cadet teachers can view themselves in the act of teaching. To television can be added tape recordings, filmstrips and motion pictures which can, if the instructor wishes, be linked into a multi-media program to achieve certain kinds of educational goals. A lecture given in the morning can be tape-recorded and placed on a continuous circle recording so it is available for several days. And the telephone has been found to have untapped uses. Through an amplification system, institutions which cannot afford television equipment can be linked together in a conference arrangement so that students in 10 different institutions can hear the same lecture and, through the telephone system, raise questions and respond to points which the lecturer made. Present levels of engineering allow a lecture podium to be equipped so that a single professor can write on the podium and have the images conveyed to the entire class by means of an overhead projector. By activating another lever, the professor can link his classroom into a television performance. Or, with another control, he can begin playing a motion picture film or recording. When the instructor in this multi-media classroom calls for student responses, the students activate buttons on the arms of their classroom chairs, and a modified computer immediately tabulates the responses before the eyes of the instructor. Language laboratories can now allow a portion of a class in French to listen to native speakers and pattern their own speech after them, while another portion of the class is speaking to the classroom manager or teacher, and still another portion of the class is using a combination tape-book system which tapes the learning of grammatical rules simple step after simple step. And the computer

seems to possess pedagogical potential which has only begun to be realized. At the University of Illinois an experiment now allows a thousand students, each working on a somewhat different task, to speak to and obtain responses from a central computer. The computer system in East Palo Alto, California, allows disadvantaged Negro children to work individually, either with a typewriter or with an electronic light stick, to learn words and mathematical solutions at a much faster rate than possible in more orthodox classroom settings. Students in the medical school at the University of Missouri, using a computer, learn not only computer techniques for diagnosing illness, but improve their own diagnostic skills as well.

Of course, there are still more examples of newer technology. Relatively inexpensive dry-copying devices enable students to obtain library information quickly and then take it home with them, leaving the basic document for other people to use. Specially equipped library tables allow students at the table to tune in to music, commentary about books, or a specially prepared program. And there are a few examples of an entire institution combining a number of technological devices into a whole new approach to education. One example is Oakland Community College in Oakland, Michigan, which serves approximately 5,000 students on a campus with only three orthodox classrooms. The bulk of student learning is done individually in booths or carrels equipped with tape recorders, small television viewers and programmed textbooks. These are connected with a central pool of information about any of the courses students might be studying. Some theorists have visualized the time in the not-too-distant future when even individual homes would contain, in place of the more orthodox study or den, an automated learning center in which all members of the family could pursue certain important parts of their initial or continuing education without the need to ever leave home. Whether or not this is likely to be realized, the range of technological devices is surely great enough to pique the curiosity of professors wishing to try a new approach to some particular educational problem.

But machines, or, in the contemporary idiom, hardware, are not necessary for innovation. Increasingly, it is felt that breaking orthodox temporal patterns is not necessarily bad and may, in fact, enhance certain kinds of learning. A number of institutions moved from a semester or quarter system to something called a four-one-four plan. This allows students to take four courses in a more or less orthodox way in the fall and four more courses from the first of February until the end of the academic year. The previously "dead time" from mid-December until the end

of January is converted into a short term during which students work on independent projects, travel, or do other things relevant to their educational program. Still others have adopted a three-three scheme, dividing the academic year into three equal chunks and asking that students take three courses in each of the three periods. Still another modification intended to insure year-round utilization of physical facilities and allow students to proceed at varying rates of speed is the trimester system, first experimented with by the University of Pittsburgh, then the Florida system of higher education, and by Parsons College. With the exception of Parsons, the trimester system has not resulted in heavy summer utilization of classroom spaces. But it has provided ways for some students to accelerate their academic career. Institutions such as Antioch College and Northeastern University have for some time used an unusual calendar which keeps a portion of the student body on campus engaged in orthodox academic work while another portion is off-campus, engaged in work related to their academic concentrations. Further, the work is for pay, and thus helps to defray some of the increasing expenses of attending college. Once upon a time the four-year academic period was considered to be normal, but the facts increasingly dispute this stereotype. In several large Mid-Western universities the proportion of freshmen graduating at the end of a normal four-year period is somewhere between 30 to 35 percent. But during the subsequent six years, enough of those freshmen receive a bachelor's degree from some place that 65 to 68 percent of the entering freshman class finally graduates. The emergence of the two-year junior college, of course, has given institutional expression to a new temporal pattern of attending college. Students can attend a junior college for one or two years, then transfer to a senior institution for the rest of their bachelor's work.

Theoretical work done in the 1950's on space and faculty utilization, supported by the Western Conference universities and the University of California, indicated that no educational losses were suffered by asymmetrical scheduling of classroom space and time and that the utilization of classroom stations was more efficient. In 1962 and 1963, the University of South Florida experimented with this scheme and discovered that it did in fact work. The university arranged classes in a variety of orders. One class might be held at 8 a.m. Monday, 10 a.m. Tuesday, and 4 p.m. Friday, while another was held at 10 a.m. Wednesday and 8 to 10 a.m. Thursday. In spite of the variance from a more regular pattern, students and faculty did adjust to the scheme quite well and were satisfied with it. A refinement of this asymmetrical schedule is contained in a computer-based process of flexible sched-

uling. Overly simplified, this is based on the notion that not all subjects or parts of subjects need the same amount of time on the part of each student. By using the power of the computer to make combinations, it is possible to put together a schedule of time for the academic year which will maximize use of space and optimize student and faculty desires regarding the amount of time needed for each of a number of tasks. It may very well be that none of the rearrangements of time is ideal for an individual institution, but since the academic year is not governed by immutable principles, experimentation is possible. Some institutions may still wish to experiment with a single course plan attempted in the 1940's by Hiram College, Chapman College and Eureka College. Under this system, students study a single course for seven weeks, then shift to another. Other colleges may wish to have a long term in the fall, another long term beginning immediately after Christmas, and a relatively short term at the end of an academic year. Still other colleges may wish to run concurrent courses which last a semester, a half semester or even a week or ten days.

Another cluster of innovations has to do with the rewards, punishments or sanctions given students in response to their educational performance. This is the entire grading issue, which customarily has been relatively capriciously lodged in the hands of individual instructors and administered in the form of a five-point scale expressed as letters. Early modifications of the grading system resulted in grades being assigned not by the instructor but by some external examiner, thus freeing the instructor to work with the student and not be in the position of a judge. The Honors Program at Swarthmore and the examination system at the University of Chicago and Michigan State University were examples of this attempt. Then, as the objectively scored examination movement gained headway, it was demonstrated by such things as the Cooperative Study of Evaluation in General Education that even quite abstract educational achievements could be measured by means of objectively scored tests. More recent discussion has suggested that for some educational outcomes a letter grade is not necessarily the most efficient device to be used. A written anecdotal appraisal conveyed to both the student and his permanent record is one way of enriching grading. For other experiences, perhaps no grades at all are appropriate. Students, particularly in competitive situations, avoid difficult but desirable courses in the interests of earning higher letter grades. Theory has it that allowing students to take at least some of their academic work in either a no-grade or pass-fail situation could encourage students to broaden their education. Thus the

pre-medical student might be stimulated to take a desired course in aesthetics if he knew that his predominantly number-oriented mind would not be penalized in dealing with a subject with a high concentration of abstract verbalism. Some students, becoming disenchanted with orthodox courses in universities, engage themselves in "free university" kinds of courses for which no grades are given and still seem to work quite diligently and gain quite a bit. This suggests that in some situations reliance on grades has been misplaced. Once again, a range of practices is probably available for most conceivable collegiate efforts. For some programs only an end-of-college examination would be appropriate. For some students, taking some of the new college-level examinations of the College Entrance Examination Board would be sufficient demonstration of competence in any of a number of courses, thus obviating the need to enroll in formal course work. Certainly the Advanced Placement Testing Program of the College Entrance Examination Board has made much more refined placement of students in college possible. Through this, students are not penalized at all if they take a college-level course in high school rather than in college.

The cooperative work program idea has begun another range of innovations. This is the plan used experimentally by Bennington College and Sarah Lawrence College in the 1930's and more recently at the University of Cincinnati, Northeastern University and Antioch College, where it has been given wide publicity. The most visible expression is the increasing number of overseas experiences. These may be a summer abroad simply touring, a summer of study in some foreign university under the guidance of American professors, a portion of the academic year spent in a foreign institution, or a portion of a four-year career spent in a branch campus of the parent institution. In all of these, it is presumed that students gain value not only from seeing cultures other than their own, but also from a break in the sometimes monotonous procession of academic activities. But foreign experience is not the only way to achieve some of these results. It is possible for students to spend a portion of their academic year working in a central city project. Other students could, for full academic credit, spend a portion of the year on a geologic survey mapping expedition. Still others, for example those in teacher preparation programs, could be sent away from the campus to live in a different kind of community while doing cadet or practice teaching. Some of these schemes, of course, bother college professors who believe that academic credit should only be given for certain kinds of activities. But the fact that even military service seems to result in quite clear gains along academic dimensions

suggests that this reluctance should be reexamined. The point could be made by asking rhetorically which experience will leave the more lasting educational effect—a course in urban sociology handled by a lecture-textbook method, or six months spent in a Southern town organizing Negroes to assume the rights of suffrage. Even the contrast of cultures can be emphasized within a relatively small geographic area. One psychiatrist teaching at the New School for Social Research made one demand on the students in a course—that they penetrate and understand a subculture substantially different from their own. The child from the upper middle class, white, Protestant background who penetrated a Harlem Puerto Rican subculture probably gained more than he would from spending a term and a half on one of the overseas campuses of Stanford University.

While the somewhat pessimistic observation concerning the paucity of suggestions which psychology and social psychology have given the practice of education is generally true, a number of the behavioral sciences are producing theory and some evidence regarding possible innovative techniques applying new psychological theory. A Syracuse University experiment showed that an instructor in the social sciences who assumes a more dogmatic authoritarian stance than do authoritarian students can force these students out of their authoritarianism into a more open attitude. A psychiatrist at Stanford has demonstrated that a reasonably well-adjusted person who is enthusiastic about something can move disturbed individuals toward a more healthy position just through the act of sharing enthusiasms. The use of role-playing and psycho-drama have been demonstrated to be reasonably effective ways of modifying attitudes about interpersonal relationships, minority group members and human conflicts. It becomes increasingly apparent that while for some conditions the sanction of punishment may be a necessary motivation for learning, in more cases appropriate reward is more effective. This probably is the psychological principle undergirding the previously cited movement toward no grades. Some of the formulations of Jerome Bruner suggest that it is possible to develop, even in the quite young, a basic notion of the structure of a subject, and that once the structure has been assimilated, specific items or information are added to the individual intellectual equipment quite easily. And Zacharias has observed, apparently with considerable reason, that individuals, in order to be able to learn, must have had the experience of trying to teach someone. He claims that it is necessary in the ideal curriculum for some teaching experience to be part of the program for every student, and this teaching need not be pedagogy applied to a young person. Younger

people, he finds, can teach older people with the same fundamental gains. Some of the testimony from students who have taught disadvantaged or culturally different individuals in Project Opportunity or the Peace Corps is an additional piece of rather strong evidence. Many of these suggestions are not yet well established by firm empirical testing. The point is that an examination of the literature from anthropology, sociology, psychology, psychiatry, and physiology suggest new approaches for teaching someone something.

Particularly in professional and technical education, a number of specific skills such as surgical incisions, the manipulation of laboratory apparatus, administration of injections, treatment of architectural diagrams with silver compounds, and other technical tasks are better taught by mechanical devices than by lectures and physical demonstrations. It now seems possible, particularly if some of the more recent technological devices are used, to teach these skills more effectively and with less monotony for the instructor by some impersonal means. Thus more students can learn more effectively about a surgical procedure on a dog through watching a television presentation of the operation itself. For even quite complicated processes, a short filmstrip with a carefully scheduled sound track is judged superior to a demonstration to a group, if for no other reason than that the student can use the filmstrip when he individually is ready to develop the skill. There is the related innovation which simply states that for many things previously taught through direct student manipulation a demonstration can be far superior. The chemistry department at the University of Kentucky became convinced that the laboratory procedures for beginning chemistry could be better taught through a well-contrived demonstration than through asking students to enter the laboratory—and there was an appreciable savings in glassware. In the biological sciences, Professor Alfred Novak has demonstrated that what he calls "dry laboratory" exercises can frequently be more effective in developing experimental techniques, attitudes and approaches. By "dry laboratory" he means presenting a uniform set of data to a class and asking it to manipulate the data alone rather than to accumulate the data through actual lab work.

Another important facet of innovation is related in many respects to what has been said thus far. This is the possibility that economies in the practice of education, rather than diluting the quality of education, can actually enhance it. Perhaps the first theoretical statement of this possibility came with the publication by Beardsley Ruml and Donald Morrison, *Memo to a College Trustee.* They argued that part of the high cost of

undergraduate education stemmed from a proliferation of courses offered, with an attendant decrease in the average size of classes. They argued that it was possible for a liberal arts college to offer a relatively few large-section courses, accompanied by a certain number of middle-sized courses and quite a few tutorial courses. The average student income derived from the large-section courses, when spread over the full teaching responsibility, would allow fairly sharp increases in faculty salaries and insure students a well-balanced undergraduate education. Earl McGrath followed this book with his *Memo to a College Faculty Member.* By analyzing the number of courses offered by different departments in each of fourteen institutions, he showed that recognized quality was not related to the number of courses being offered. The much-publicized Parsons College in Fairfield, Iowa, demonstrated that by limiting the number of courses in the curriculum and charging reasonably high tuition it was possible for tuition income alone to pay quite high faculty salaries. Unfortunately, the Parsons experiment was contaminated because of premature public utterances on the part of its president, and because other parts of the institution's operation were allowed to fall into financial disarray. Florida Presbyterian College anticipates that it will be able to remain competitive for strong faculty persons and at the same time support its instructional programs with 85 percent of the funds coming from tuition income. This is really putting into effect a modified Ruml plan. It is even conceivable that such high-cost institutions as the major private universities could, by judicious pruning of curriculum, bring their financial houses into better order. Curriculum revision is just one area in which economies might be possible. Mention has already been made of the use of independent study as a means of stretching instructional resources. Mention could also be made of video-tape recorded lectures which could be used to extend the influence of the professor by giving them to larger audiences. The use of amplified telephone conference work suggests the possibility of colleges obtaining their consulting services not by on-campus visits, but through telephonic communication. While the implementation of a computer-based administrative program will cost additional funds, presently available computer facilities do make data immediately available, which perhaps can make decision making a little bit more rational.

Clearly, innovations are possible in rearranging the nature of college courses and college course instruction. During the 1940's and early 1950's a number of programs in general education attempted to offer what were called interdisciplinary courses. It is just possible that the general education movement

was a generation premature. So many of those interdisciplinary courses tended to be surveys of a potpourri of knowledge, opinion and insight from a number of different fields. Presently, however, the research frontiers are inclined to be interdisciplinary in character and may very well suggest the rationale by which courses of a genuine interdisciplinary character can be provided. In a sense, the student demand for such courses has been expressed by the requests of students for "free university" types of courses. These courses transcend the logic of any particular subject and try to focus on significant problems as students see them. Thus a free university course can focus on Drugs and the New Generation or Sino-American-Russian Relationships. It is assumed that for each of these problems, people of several disciplines could have something to say and the result would be a gestalt. One of the most pronounced anticipated trends in graduate education in the United States is an intensification of interdisciplinary doctoral programs. As these come into full being, a cadre of teachers will be prepared who can offer interdisciplinary courses for the undergraduate population. It may well be that if these interdisciplinary courses become widely adopted, the single teacher system may give way—at least slightly. One can visualize an undergraduate course on Florence in the Fifteenth Century being taught by an art historian, a literary scholar and a political historian. At first blush, such a team approach would increase the cost of education, but the cost of that rich sort of offering could possibly be offset by economies elsewhere. It should be indicated that the potentiality of interdisciplinary courses is clearly present, but that there are major obstacles which institutions must overcome. Although some deans of academic affairs anticipate a gradual erosion of the powers of subject matter departments, this is something for the future to reveal. Presently, especially in major universities, departments represent the strongest bastion of power and prestige, and typically the departments throw their influence not on interdisciplinary work but on straight disciplinary work. Faculty members, sensitive about their own professional futures, still are inclined to stay with a single subject department rather than to enter into the somewhat dangerous ground of interdisciplinary work.

Several other sorts of innovation should be mentioned quickly. Historically, higher education has not been a planned phenomenon. The organic nature of a university is a medieval conception interpreted by English-style colleges, colonial-style colleges and German-style universities. But long-range planning of what the services should be has, until the end of the 1950's, been generally unpracticed in American institutions. However, the financial

crisis which faced higher education in the 1950's, and the anticipation of large increases in enrollment, finally forced institutions to begin thinking about long-range fiscal and physical plant planning. When this process was undertaken, the absolute imperative that it be preceded by sound academic planning became apparent. Thus, a condition exists today which is hospitable to a thorough, conscientious, systematic pondering of the purposes of education, for the very simple reason that this is economically sound. In 1967 alone, several large state systems of higher education have, for the first time in their histories, caused branch campuses to make explicit long-term educational goals and plans for the implementation of a program to achieve those goals. Thus, what at one time was assumed to be the jargon of education—that is, the setting of educational objectives—has now become a highly respected and necessary act. The 47-year-old School of Architecture at Princeton, for example, is currently using the theoretical constructs of curricular analysis developed by Ralph W. Tyler to try to discover what should be the education of architects who will be practicing well into the twenty-first century. It is strange that planning within a pragmatic society should be considered an innovation. Yet so recent has been the validation of planning that it must be so considered.

Then there are specialized programs for unique categories of students. During the late 1940's and 1950's, a number of institutions developed remedial centers and remedial programs. While some of the techniques did not actually work very well, nonetheless the remedial movement demonstrated that not all entering students had the necessary preparation to do college-level work. Then in the middle 1950's, higher education became concerned that the particular needs of the highly talented student were being overlooked as institutions directed their basic teaching for the middle-level student, and their specialized efforts for the marginal one. Thus the innovation of programs for the gifted: honors courses, honors degrees, and even honors colleges. Once again, some of these innovations or efforts did not prove particularly lasting, partly, one must assume, because they were not adequately funded. A professor will work with honor students for a year or so simply because he is interested in them, but unless he is rewarded in the tangible things of his profession, he will not carry on these activities for long. Since the development of programs for the superior student, colleges have begun to be aware of other categories having equally discrete and unique needs. Research in the early part of the 1960's identified the creative person, who might or might not be the same as the academically talented, served by programs for the superior student. More recently, one

must reluctantly infer, colleges have become aware of the needs of the culturally disadvantaged, and have begun to develop compensatory programs, enriched programs, and programs involving specialized pedagogy in an effort to help disadvantaged groups move into the mainstream of American society.

Casual mention has already been made of the possibility of several teachers working in the same course, but there are other examples of team teaching which have yielded impressive results. One of the earliest attempts was Boston University's College of Basic Studies, a two-year college designed to serve students whose prior academic records denied matriculation to any of the four-year colleges in Boston University. Students were admitted to the College of Basic Studies in groups of 80 to 100 and required to take a prescribed curriculum during the first two years. A single core of faculty with offices close to each other shepherded the group through the full two years. Thus both faculty and student recruitment had to be a block affair. Typically, these students entered with SAT scores substantially below those of students entering the other parts of Boston University, but by the end of two years registered substantially above college seniors on the Area Test and the Aptitude Test of the Graduate Record Examination. For some years now, Stephens College has maintained a house plan. This enrolls a hundred students who live in a residence hall designed for that number and take an almost completely prescribed curriculum during the freshman year. The curriculum consists of one course in the humanities, one in the social sciences, one in philosophy, one in English, and provision for one or more electives. A faculty of five, which includes a resident counselor, offers these courses to the group of one hundred students. In spite of this somewhat high student-faculty ratio of 25 to 1 for teaching faculty, the flexibility which a core program allows and the intimacy which the house plan allows make it possible for faculty to provide much greater individual attention. For two years now, a similar matching of a team of teachers with a group of students has been attempted in a commuting college context at Chicago College North. In some way or other, the consistent interaction between students and their teachers which such groupings make possible has facilitated a greater concentration on curricular matters in most of the experiments conducted thus far. These students seem to gain much more than other students, when assessed by measures appropriately common to both groups.

Some brief mention should be made of the innovations possible through imaginative architecture. A few recently created libraries—the Earlham College Library is an outstanding ex-

ample—are built on the notion that students really don't like to study in large groups and at large tables. Thus the library is arranged so that there is no central reading room. Instead, study spaces and study chairs are scattered throughout the library, giving a feeling of informality and seclusion. In the past, one had the feeling that the size of some sections of colleges was mandated not so much by pedagogical reasons as by the availability of space. Increasingly, architects are finding that a variety of space sizes is needed, but that it would be extravagant to create such spaces in a permanent form. They have found that the use of movable partitions and the wise employment of carpeting (which allows a large, long space to contain many different groups, each conducting its business without disturbing the others) can provide this needed flexibility. The possibilities of bringing learning and living together have finally been apprehended and it is now seen as quite appropriate to place learning spaces in residence halls, even including faculty office spaces. It should be pointed out that the creation of new academic facilities which really do facilitate the educational mission requires that faculty be involved definitely and continuously in the planning. But to do so, even though planning physical structures is a time-consuming process, is to gain another by-product as faculty members are forced to spell out what kind of space they want. They must answer the prior questions regarding what sort of educational program they propose to mount and to what ends.

These, then, are some of the innovations in higher education which are possible. Quite probably there are others, such as varying the size of instructional groups, the use of summer counseling clinics, the pairing of teachers of English with teachers of other subjects so as to obviate freshman English, reconstruction of courses and programs in general education, asking faculty members to live in residence halls so that more ready interaction with students is possible, and combining courses into new and more efficient configurations such as joining first year organic chemistry with the first year of physics into a new physics-chemistry course. But enough innovations have been suggested to underscore the point that approaches, techniques and devices are available if faculty members want to avail themselves of them, given the need for innovation. The next task must be that of motivating faculty members to experiment.

chapter 3

Techniques and Mechanisms for Change

Given the present level of understanding about how changes are effected in individual practice or in the nature of institutions, no definite and well-tested guidelines for change can be given. However, individual testimony and some observed institutional experiences suggest what ultimately might become elements of a theory of innovation.

Perhaps the most important element in effecting changed practice on the part of individual professors is to contrive to have them become personally involved in a movement which makes explicit to them the importance of teaching, the fact that others are concerned and the fact that change is possible. In Florida, young junior college teachers are brought together in workshops with colleagues from other institutions to discuss common educational problems and to make plans and commitments for definite experimentation. The Florida experience also allows faculty members from each of six institutions to visit all other institutions of the group, one each year, to allow exchange of ideas as to how things seem to be going. Faculty members come together in a workshop to plan an experiment for the next year, conduct the experiment, and then come together in a workshop the following year to report on what they have done. The Union for Research and Experimentation in Education sponsors a similar kind of activity for individuals who are brought together for a summer workshop to plan an innovation, then provided resources to conduct the innovation and finally brought together a subsequent summer to assess the experiment.

The Danforth Foundation has for eleven years conducted workshops on liberal education. It invites 25 colleges each to send a delegation of four faculty members to a two-and-a-half or three-week workshop. During the workshop, individuals may participate in seminars dealing with broad educational questions and delegates work as a team on projects having significance for their own

institution. At the end of the experience the team is asked to report in writing on its plans, and then to report the progress of the new attempt during the following year to a representative of the Foundation.

In the 1950's, the American Council on Education sponsored the Cooperative Study of Evaluation in General Education. This study was conducted by bringing together representatives of each of six curricular areas in general education programs from 19 different institutions. For the most part these representatives were classroom teachers with no particular expertise in tests, measurement, or evaluation. They were provided a variety of experiences including summer workshops of one or two weeks' duration, shorter fall and winter meetings, visitation to campuses by members of the study central staff, and the organization of local committees to carry on the work of the study. The work of the study was to make explicit the purposes of general education and to devise instruments by which the outcomes of general education could be assessed. The very act of attempting to do these two things indicated to a number of the participants that much of what they were doing in their classrooms was just not relevant to the goals of general education.

The task of teaching is a difficult one, particularly since the outcomes of teaching are so difficult to assess. In the absence of close involvement with others making a definite effort to bring about changes, an individual is likely to feel more secure engaging in a limited number of well-tried practices. But if a teacher can be associated with others in some joint undertaking, he gains considerable strength from this and seems willing to depart from orthodoxy. This point about involvement can also be made negatively. The University of South Florida has conducted orientation sessions for new faculty people. These are evening meetings held during the fall semester, in which presentations are made about such things as grading, the use of television, and the like. For the most part, they have not seemed very successful. The new faculty members felt it was something being done to them rather than something in which they were involved. The same institution also has maintained an all-university committee on instruction which is charged with stimulating faculty members to think about newer ways of teaching. Again, the committee has not been judged particularly successful because it appears almost as a wing of the administration seeking to do something to faculty members. In some way or other, the office or agency on a campus desiring to bring about change in method or mode of instruction must contrive a situation in which individual faculty members become deeply involved, intellectually and emotionally.

This concept of contriving underscores the basic dilemma in college or university government. There is strong desire for a collegial form of government in which decisions are arrived at by consensus. Yet, in practice there is, and very likely must be, a hierarchial form of government in which one element of the community is labeled administration and the other faculty. Within American higher education the faculty has been inclined to be conservative with respect to educational and instructional matters. The subjects taught are normally conservative subjects, keeping and recording important cultural elements for the future. The division of college faculties into departments based on subject matter categories also contributes to conservatism. The administration, on the other hand, is the dynamic element. It is the administrative officer who is charged with exerting educational leadership. It is typically the administrative officer who hears of innovations being practiced elsewhere and seeks to have them adopted on his own campus. It is the central administration which must take a look at the total mission of the institution and then marshal the energies of the faculty to achieve that mission. Thus the administration is the natural agent of change, and it is the administration which is expected to contrive those situations which will involve faculty. It is the administration which must make the strongest effort to keep channels of communication unclogged. It is the administration which must seek to develop a consistent philosophy of education which can govern practice and establish parameters for programs. Throughout this inquiry regarding innovation, the point was repeatedly made that some person or agency, generally representing administration, was required to take initiative in helping faculty members to do things which they would not be expected to do normally.

In just the past four or five years a new administrative subspeciality has begun to grow up on the campuses of the nation's colleges and universities. The following description will serve to catalog a few of these. Florida Presbyterian College lodges in the academic vice-president responsibility for being the principal change agent. He views himself as a catalyst operating in an intensely political environment, his principal responsibility being to facilitate innovation and change in the educational process. The University of South Florida created positions for a director of institutional research and a director of educational resources, both of whom were responsible for stimulating changes in educational practice. In addition, the University of South Florida sensed a responsibility for effecting changed instruction in a number of the state junior colleges. With outside financial support, the university has organized activities designed to im-

prove instruction both in the university and in a cluster of junior colleges.

The University of Georgia created an institute for higher education and assigned it several innovative missions. It is to aid in the recruitment and training of new college teachers and to serve as the institutional research agency for the university. It facilitates cooperative work with other colleges in Georgia with a view to improving both the training and the quality of teaching. It also maintains a comprehensive information system which will provide many institutions in the state with information that can be used for responsible decision-making.

The University of Michigan has created a center for the improvement of instruction and has staffed it with a number of psychologists, each of whom represent a different psychological sub-specialty. This center is assigned the mission of advising, consulting, and assisting the university faculty in the improvement of instruction. The University of Tennessee created a learning resource center after a university committee realized a need for several different functions. There was need for continuous research regarding teaching, for dissemination of information about teaching to professors whose time normally was spent becoming more proficient in their disciplines, and for stimulating faculty experimentation with new educational approaches. A modification of the Tennessee center is the center for the improvement of instruction in mathematics and science at the University of Texas. The University of Kentucky and Oxford College followed more closely the pattern of Florida Presbyterian, and assigned responsibility for innovation to the dean of the liberal arts college.

Stephens College has long maintained a director of research on a part-time basis. This individual, visiting the campus several times each year, attempts to stimulate faculty experiments with new ways of teaching or new ways of organizing the curriculum. In addition, the college maintains a director of educational resources who is responsible for maintaining contact with funding agencies and for facilitating faculty use of a range of pedagogical materials, especially those which could be classified as the new media.

In the light of this premise regarding the role of administration, several guidelines can be suggested. First, an administration seeking to stimulate innovation or change should have a clear notion of the nature of academic government. One such theory emphasizes four points: (1) that administrative authority, regardless of form and/or legal structure, consists of what is willingly delegated to it by personnel within the organization, (2) that the primary body within this organization of governments is the faculty, which functions responsibly through representative chan-

nels and designated institutional officers, (3) that the faculty is interested in assuming and coordinating leadership and can be educated for such leadership and cooperation, (4) that the end result of such a process is the maintenance and enhancement of a productive morale—a condition or attitude in which individuals in representative groups make reasonable subordination of their personal objectives to the overall objectives of the institution. The factors essential to such a condition or attitude are feelings of mutual respect; a sense of common task; a recognition of the role of politics, debate, understanding, and due process; and the understanding that the basis of good government is ultimately the quality, character and policy that exists in and between the persons and groups within the government.

While such a statement concerning the nature of academic governments assigns considerable responsibility to the faculty, it does not detract in any way from the responsibilities and prerogatives of the administration. Consider several uses of one administrative prerogative. It might help for the administration to require as one of the conditions of faculty employment that each faculty person prepare a joint description indicating broad responsibilities and purposes. Such an act not only can help a new teacher understand more clearly what he should be doing, but the outcome can also serve as a basis for periodic evaluation of his progress. Thus, when a new faculty person joins a staff, the written statement of his understanding of what he is to do is placed in his confidential personnel file. At the end of the first year he has an interview with his immediate administrative superior to discuss what he has actually done to implement the job description. During the same interview, plans can be made explicit for professional development during the next year and again reduced to writing to be placed in his personnel file.

This end-of-year evaluation can and should be extended to cover other evaluative pieces of evidence. If a college or university sincerely wants to make changes in status on the basis of merit, then it should make a consistent and conscientious effort to evaluate as carefully as possible. One technique might be for each faculty member to be given a form on which he indicates what he believes he has accomplished in the classroom, on the campus and in the larger professional world. He can be asked to indicate what frustrations he has experienced, what he was unable to do, and what things he would like to do. In the light of the professor's own statement and the judgment of the division chairman about the individual, the division chairman could then be asked to evaluate each person reporting to him. At this level it would probably be good to ask division or department heads to rank

professors in one of three categories. This information should then be channeled to the next higher administrative office which, in the case of a small institution, might be the academic dean, or, in the case of a larger institution, might be the dean of a college. Each professor should have his end-of-the-year conference with this individual.

While evaluation of relevant activities is a powerful force by which administration can exercise leadership, there are others of equal potency. The manipulation of rewards, prerogatives and perquisites is an important device. Greater use of individual independent study can be encouraged by paying a professor extra to offer such a course. Providing a faculty member with paid periods of leisure during the summer, to allow him to prepare for an innovation, is likely to be more productive than expecting him to make the preparation on top of an already full schedule of teaching and scholarship. In this connection, the catalogs of American colleges and universities are full of descriptions of programs for superior students, or programs for independent study which are not operational. They are not operational primarily because they were created as overloads on faculty members without commensurate remuneration. A faculty member may direct independent study of students for several years because he is interested and enthusiastic about the idea, but unless this effort is rewarded in some way, he is likely ultimately to devote his time and energy toward increasing his own stature, his own earnings or his own personal freedom.

Courses in general education have experienced difficulty retaining strong faculty people primarily because the problems of the reward system were not accurately analyzed. Within the American system, as has been indicated, rewards have in the past been associated with departmental, subject matter, or discipline-related activities. It is through the department that the person publishes, receives outside financial support, and establishes his professional reputation. To ask an individual to teach an interdisciplinary course is to ask him to divorce himself from his secure source of rewards. Unless the institution secures comparable rewards for the new activities, one can predict the new activity will not be particularly attractive. One institution, in recognition of this problem, has a sabbatical leave policy which allows a person who develops a new course in general education to take his sabbatical leave at the end of three years rather than at the end of six.

There are, of course, numerous minor rewards which can encourage faculty to be innovative, or at least intellectually alert. The provision for adequate clerical services, authorization of

reasonable travel funds, institutional purchase of journal article reprints, and attention of the full institution directed to notable achievements are all illustrative. Even such a small thing as an administrative officer going to a faculty member's office rather than calling the faculty member to the central administrative building can develop rapport which can be a potent tool to stimulate faculty motivation to change.

The administrator who is willing to make faculty members truly responsible for the consequences of decisions about their own affairs also illustrates good administrative practice. During the time when the State of Michigan was experiencing a severe financial crisis, the faculty members in one college of one of the tax-supported universities in that state were given the largest salary increases in the history of the institution. The university received no increase in appropriations but anticipated and experienced a substantial increase in student enrollment. The dean of this college gave his faculty the choice of devising ways to accommodate increased enrollment with no additional staff, but with increases in average faculty salaries, or to keep the student ratio as it had been by adding necessary staff members with only nominal changes in salary. The faculty, under this stimulus, responded creatively and discovered that adding five persons to each laboratory section did not really spoil the whole concept of a laboratory experience in a natural science course.

As indicated earlier, communication is essential, and sound, effective communication is a primary responsibility of collegiate administration. Initial communications with faculty members take place at the point of employment, and proceed through various individual conferences over the years of a professor's service. But these are not enough. There should be a variety of written communications between the central administration, the faculty, board of trustees, students and even parents. There might be voluntary faculty meetings in which no decisions are made but matters of controversial nature are discussed. The administration could well use social activities as a way of communicating. Even contriving a faculty caucus in which no administrative officers are present could be a way of unclogging channels of communication and insuring greater freedom of expression. The point being made here is that innovation and change are most likely to come about in an open society in which most people know most of the things important to them personally and to the group of which they are a part.

Even a strong, imaginative collegiate administration cannot operate without fully recognizing the enormous elements of power which do exist among college faculties. Normally, there will be

a limited number of professors whom everyone respects and judges to possess controlling influence. To engineer change, the administration should make full use of such people, not only because it is politically wise, but because it is a way by which the broadest hearing can be given to innovative ideas. The general education unit of Michigan State University succeeded in large measure because the president of the university selected a key member of the faculty of the college of agriculture to chair the committee investigating general education, and then designated that same individual as the first dean. Associated with the dean were four or five of the university's outstanding scholars who were asked to serve as department heads for the newly formed college of general education. The stature which these appointments gave insured survival of the infant programs for at least a few years, and if they could survive that formative time, the likelihood was good for a long tenure. The University of Kentucky, since 1963, has funded a major self-study that created a broad new academic plan, initiated a new program of general education, began a systematic program of faculty evaluation with sanctions based on merit, and created a new academic organization designed to facilitate innovations. This all came about as a result of careful planning by a highly capable new president who sensed there were strong elements of faculty influence upon which he could rely to bring about changes. Once these faculty members became convinced of the validity of new ideas, in the judgment of one of the new deans at the university, the result of administrative leadership was a transformation of the University of Kentucky.

Innovation and change are not likely to come about unless the need for them is clearly perceived. A number of the more successful innovations are clearly traceable to the simple fact that a need had become painfully apparent. At Oxford College the majority of students are seriously in need of remedial work in language and mathematics. The faculty was quite aware of these deficiencies in basic academic skills, but did not possess the time to rectify them through orthodox ways. When programmed textbooks and multi-media approaches to instruction became available and the faculty was shown the relevance of these new devices for remedial work, an innovation was quickly accepted. Without the stimulation of this actual need, the faculty could have seen this as intensely threatening. Michigan State University also was able to move to programmed work in remedial mathematics when the widespread quantitative deficiency of the student body was generally realized, and when the mathematics department realized that it was too small to serve all of the functions expected of it.

A handbook on improving instruction and on the supervision of instruction succeeded when it was directed specifically at the chairman and section leaders of large multi-sectioned courses in a large institution. Had the same booklet been directed at the faculty generally, it would not likely have had its impact. Another booklet, at the University of Michigan, contains a number of suggestions on improving instruction and seems to have been quite well accepted because it is addressed to new faculty members. It contains a great deal of routine information, simply informing faculty members how to make their way around that complex campus. Again, there is a strong presumption that had the booklet been addressed to the faculty generally the impact would have been much less pronounced. The previously mentioned workshop program involving teachers in junior colleges and universities in Florida quite probably has succeeded because both university and junior college people realized how crucial it was that there be good curricular articulation between the two levels. The University of Georgia program of awarding pre-doctoral assistance valued at $4,000 a year to faculty members from Georgia colleges is currently flourishing because the small Georgia institutions are striving mightily to increase the proportion of Ph.D.'s on their faculties. They are quite willing to give a young faculty member a leave of absence so that he can complete his doctoral work and, at the same time, be introduced to some new ideas about teaching. Since uses of the computer are currently coming into vogue, a University of Michigan workshop for faculty that shows how computers can be used has been quite a successful venture both from the standpoint of the number of people influenced and increased utilization of computer service. At the University of Texas, a general questioning attitude within the department of chemistry concerning the nature of laboratory work in beginning chemistry provided the opening for the Center for Improvement of Instruction in Mathematics and Science to bring about a major change by separating the laboratory from the lecture course. By keeping the credit hours of both equivalent to what they had been, it became possible to eliminate laboratory work in chemistry for the non-science major.

The significance of this point cannot be over-emphasized. Until the events at the University of California at Berkeley in 1964 dramatized a need for a reappraisal of undergraduate education in major universities, the primrose path of increased emphasis on research and upper division and graduate work was being followed by most institutions having pretensions of major academic stature. The events at Berkeley and a few other in-

stitutions indicated that the time was ripe, that the need was present, for a renaissance in undergraduate education.

Related to this matter of seeking innovation where need for innovation is present is the principle of providing *ad hoc* assistance for professors as they develop their own ideas. At the University of Michigan a Wolverine Fund of $25,000 can be dispersed in quite small grants to help faculty members solve a particularly vexing problem. This is not long-term assistance, but assistance given on an *ad hoc* basis for an immediate problem. A professor in architecture, for example, became discouraged at routinely teaching a procedure to each class of students. A small grant from the Wolverine Fund allowed him to develop a filmstrip and tape recording which could teach the process more effectively than a face-to-face confrontation, and could teach it when each student was ready to make use of it. Short summer workshops, lasting from two days to a month, allow faculty members at Stephens College to work on some small problem which has plagued them and which they have been unable to find sufficient time to work on during the normal academic year. Thus an office or agency interested in building influence as an agent of change would do well to understand the areas of likely *ad hoc* faculty interest, and be prepared to exploit expressions of interest on quite short notice. The new director of psychological services at the University of Georgia Medical School spent the first eight months of his appointment just familiarizing himself with medical education, its problems, and what sort of difficulties faculty might encounter in developing innovative ideas.

A major device for facilitating innovation and change in college teaching, which by no means has been perfected, is to gain the support of people whose primary obligations and loyalties are with academic disciplines. Within the academic system, faculty members think of themselves not as teachers in a generic sense of that word, but as historians, sociologists, chemists and the like. It is only when they can see that an innovation helps—or certainly does not hinder—their functioning in the disciplinary roles that the innovation is attractive. Many different attempts to link the disciplines with pedagogical innovation have been attempted and some have been successful. The American Association for Higher Education convened a meeting with representatives of the learned societies. This meeting became self-perpetuating in the form of an *ad hoc* committee which took as its first task the preparation of a unique kind of book. The first portion was to be prepared by an eminent psychologist, indicating basic learning principles. Then for each learned group, a special second half was to be prepared by a respected practitioner in the

discipline. Thus there would be a tailor-made handbook for historians, and another for sociologists, and still another for philosophers. It would be hoped that this aura of respectability would make the book on teaching acceptable to departments in large universities as well as small colleges. Further, each booklet was to be directed at an area of great need, that is, multi-sectioned courses, so that in no way could it appear as a threat to senior faculty members convinced that their own techniques of teaching were eminently sound.

Florida Presbyterian College has managed to have independent study widely accepted, partly because faculty members were shown how undergraduate students could be associated with them in their own research undertakings, with quite respectable results. The fact that a piece of work done by a freshman in chemistry was published served as potent evidence to the discipline-oriented faculty that a new wrinkle in pedagogy could be respectable from a subject-matter point of view. The fact that all professional staff members in the University of Michigan center for the improvement of teaching are psychologists and all have appointments in appropriate academic departments in the University makes the rest of the faculty more susceptible to seeking the services the center can render. The writer has had considerable experience consulting with liberal arts college faculties about innovation and improvement in instruction. He is convinced that one reason his suggestions have sometimes been found acceptable and followed is that his training is in the academic field of history in which he has both a master's and doctor's degree.

The University of Texas maintains a small center for the improvement of instruction in mathematics and science. Its greatest impact is gained, however, from the fact that its advisory committee is composed of faculty members from a number of the departments, and that those faculty members are among the most distinguished scholars the University possesses. And certainly, in this connection, the fact that Professor Gerald Zacharias was a distinguished physicist made possible the national acceptance of the need for a revision of secondary school physics courses.

This guideline is clearly related to one involving the relationship between collegiate innovation and schools or departments of education. Theoretically, since faculty members in schools of education are professionally concerned with the process of education, they should serve as an important resource to help collegiate faculties improve their teaching. But schools of education have been so preoccupied with the problems of elementary and secondary education, and have been so inclined, on occasion, to over-elaborate the obvious, that they have alienated themselves

from the processes of education on the collegiate campus. There are, of course, some exceptions. It is interesting that some of the more highly regarded schools of education are those in which large numbers of professors were trained outside the school of education. The principle, then, is that given the present climate, an effort to stimulate innovation and change in a college or university should be related in no organic way with a school of education. Ways should be open so that the agent for change could use relevant resources from a school of education, but the effort itself should be lodged somewhere else. Hopefully, this condition will shift as strong departments of education or schools of education develop respected centers for the study of higher education. Greater contributions to such things as the improvement of teaching will be possible, but this may be a long time coming. The Center for the Study of Higher Education at the University of Michigan has maintained a seminar for the improvement of college teaching with considerable success, primarily for two reasons. The first reason is that the advisory committee for the seminar represents the total university, and the second is that one of the leading pioneers in the seminar was a distinguished psychologist who went on to become the head of the largest psychology department in the country.

The use of the "sociological stranger" is increasingly seen as being of considerable importance. The sociological stranger is one who is a part of an institution, yet is apart from it. One of the earliest expressions of this concept was made at Stephens College in Columbia, Missouri. The Dean of Education at the University of Illinois, who then became the first director of research at Ohio State University, W. W. Charters, was designated as director of research on a part-time basis at Stephens. He went onto the campus several times during a year to consult with individual faculty members, listen to their problems, suggest experiments, or point out things to which the institution should give attention. Then by establishing deadlines he would create motivation for action when he departed the campus. On his return to the campus, he would check back to find out what had happened. By having reasonably high status, he reported directly to the president, but having no administrative responsibility, he could fire no one, and by being a person with great personal integrity, he could look at the institution more objectively than could the people who were there day after day. This role requires something more than just a one or two-day visit of a consultant, although consultants' services can be of value.. The role of the sociological stranger requires that the person who plays it be familiar enough with the institution to identify areas of need, sense readiness for innovation,

and be able to tap the resources to bring it about. An institution making use of this device should consider contracting with someone for a period of at least four or five years. A first visit of several months on the campus would help the stranger know and be known. Visits of about five days' duration three or four times a year should then suffice.

Consultations of one and two days at a time also have value. Frequently the observations of a person from some distance away from the institution will have more acceptance than observations made by key persons on the campus itself. Frequently, an administrator will know full well where innovation is needed and the source from which it should come. But the suggestion for the use of a new calendar, a new method of teaching, or even a new course comes better from the mouth of an outsider. If the outsider has a prestigious disciplinary affiliation and comes from a distinguished sister institution, so much the better! Of course, bringing in a consultant to fulfill such a role can be dangerous. It is possible the consultant's ideas are not as well-known by the inviting administrator as he thought they were, and a visit from such a consultant could build up an effective counter-force against innovation. At present, there seems to be a relatively small cadre of people who have successfully played this role of consultant or sociological stranger in a number of institutions.

Not only the part-time consultant or sociological stranger can be used, but outside forces and agencies can be used to bring about change. Clearly, the United States Office of Education, with its financial resources standing ready to support innovation, is one source; but even state legislatures can fulfill this role. Oregon State University, at the prodding of the legislature, is having to look at the improvement of undergraduate teaching. The legislature appropriated one-half million dollars to be distributed in increments of $1,000 over a biennium to undergraduate teachers. Several Oregon institutions rejected this as legislative interference with academic freedom; that is, legislative judgment in what is essentially a professional matter. But several other Oregon institutions, including Oregon State University, did accept funds. The institution now has the responsibility of selecting faculty members each year who will receive an award of $1,000. The Oregon State climate was modified considerably during the first year of operation of that program. For 20 years, Oregon State had students use an optional teacher evaluation form. During these 20 years, the highest number of forms used in any one year was 15,000, and a normal year's use was between 6,000 and 7,000 copies. During the first year of the rewards, 12,000 copies of the evaluation form were used in the first term and

7,000 more forms were used in the second term; 15,000 more copies were ordered in advance for use during the spring term which, incidentally, was the term in which the selections were to be made. From this it can be argued that the legislative action did stimulate that faculty to think seriously about teaching, so much so that faculty members who never before had used an evaluation device were trying to get some insight into their own practices to answer the question "How am I really doing?" Accreditation agencies have been used in a similar way, with a visiting committee exerting pressure that those on the campus concerned with innovation were powerless to exert. Foundations, alumni bodies, organized parental groups and, quite clearly, organized student groups are available as potential forces for change. Clearly, there are dangers. The American university prides itself (unrealistically, one should add) on the fact that it stands independent of the rest of society. Actually, colleges and universities stand as service agencies for society and must be responsive to its needs. When the sponsoring society finally does express itself as wishing improved instruction, institutions and their professional faculties may have to respond or else lose their viability.

For over 20 years, the North Central Association has conducted a Study of Liberal Arts Education which is really a device to help about 80 colleges improve themselves. This is an outside force which facilitates communication and stimulates innovation through workshops, campus visits of consultants, and special projects. One of these projects has especial relevance here. Eight colleges in Kansas agreed to try to improve instruction through a research study. Using a method called the Critical Incident Technique, student judgments about effective teaching were obtained from 2,000 students. The survey simply asked students to tell something a teacher did within the past two-week period which was effective and something the teacher did which the student concluded was ineffective. All these incidents, when classified and categorized, helped the faculty see themselves as students saw them.

The next guideline, in one sense, is simply an extension of the need for communication. But in another sense, it is a completely different point. A vast amount of information is becoming available about higher education and its practices. There is the outpouring of research, either in book or article form, or in more fugitive form, from centers for the study of higher education. There are increasing numbers of professors of higher education who are directing doctoral studies focusing on the collegiate enterprise. Increasingly, members of some of the disciplines are

doing research on higher education. Many institutional research offices are producing information, as are such para-educational agencies as the Educational Testing Service and the College Entrance Examination Board. This literature is approaching flood stage, but much of it has relevance for an individual faculty member seeking to innovate. The question arises, however, as to how the relevant information can be brought to his attention. One of the important missions which the centers for the improvement of instruction see for themselves is the dissemination of information. Generally they publish news bulletins, letters to the faculty, or brochures which describe what is going on at the local campus or elsewhere that might be of interest to the deans and faculty members. For several years, at Stephens College and at the University of South Florida, a brochure was distributed about every three weeks entitled "Research Notes." This summarized research studies most likely to be of interest to the faculties of these two institutions. Both the University of Michigan and the University of Tennessee publish similar brochures, each one of which, however, deals with but a single topic. Written dissemination is probably not enough; there is room for the informal faculty meeting or bag-lunch meeting at which interested faculty can be informed of new experimental developments. There is also room for the institution-wide, statewide or even regionwide conference to acquaint faculty with what's new in teaching. One of the important roles which the annual Conference on Higher Education, sponsored by the American Association of Higher Education, performs is this dissemination or communication function. It is the need for more information, written in capsule form, that lies behind the development of the *Chronicle for Higher Education,* which attempts to bring information to faculty members as quickly as it happens. Currently, there is serious consideration of a new journal, to be entitled *Educational Change,* which will try to interpret in depth significant innovations in teaching. The United States Office of Education series, *New Dimensions in Higher Education,* has proven of considerable value and the Office is now considering several intensive searches of the literature, so as to bring to the college teaching profession up-to-date information about new developments.

One of the more important tools for motivating an institution for change is the use of an institutional self-study. Part of the regeneration of the University of Kentucky came from a massive self-study which then became the basis for an equally massive academic master plan. Stanford University shifted its character from that of a strong regional university appealing to bright,

wealthy, underachieving students to a university of international stature primarily as a result of the findings of a self-study. Stephens College, of its own volition, undertook a self-study when its administration believed the time had come to minimize the traditions of an earlier era. That self-study was used to loosen up the soil of academia so that a new president could have a reasonable chance of exercising academic leadership. It is true that occasionally self-studies have an opposite effect. Bowdoin College, for example, after conducting a Ford Foundation-supported self-study, reported its finding in a booklet entitled *Education in the Conservative Tradition*. The central thesis of that report was that virtually everything going on at Bowdoin was good and that there was no reason to change. But a self-study, if it utilizes a large segment of the faculty and truly inquires into all parts of the institution, can become a significant vehicle for change.

A last guideline is simply a restatement of the aphorism that nothing succeeds like success. The faculty at Oxford College looked more readily on multi-media devices when it was demonstrated that student deficiencies in academic skills could be rectified by using automated self-instructional devices. Some faculty at the University of Tennessee were willing to vote a policy of allowing any course to be taken by independent study when it was demonstrated that certain students achieved better by not attending class than when they actually faced the teacher. Florida Presbyterian College was able to expand independent study throughout the four-year collegiate period, and to a larger number of students, when it was demonstrated that during a five-week inter-session term freshman students could do creditable independent work. Nursing schools embraced such things as filmstrips and tape-recorded instructions when it was shown that nurses who learned administration of a hypodermic needle with an orange, filmstrip and tape were more proficient than nurses given instruction by a physically present instructor. This, of course, leads to the significant point that built into every effort to innovate should be the accumulation of information which can help establish, for even the most critical people, that the experiment was or was not a success.

Out of these broad guidelines it is possible to derive several principles which may combine one or more of the guidelines. These principles are advanced with the intent that they could become categories in an emerging theory of engineering for change. The first principle is that vigorous, strong, and occasionally ruthless administrative power is necessary. It was earlier observed that in the American situation, faculties are es-

sentially conservative, while administrative officers are essentially dynamic and creative. Now, if an institution lodges too much power in the hands of the faculty, the institution becomes moribund. Innovation just doesn't take place. Yale College in the 1820's was in such a situation, as illustrated by the fact that the faculty could come out with an ultra-conservative document saying, in effect, we care not for numbers, we care not for practicality, so long as we remain true to our principles everything will be all right. Yale almost went under. When the administration is too strong, the sheer rapidity of change can shake the institution to pieces. An institution can only assimilate so much change in a given time. Very likely the problems of the University of Pittsburgh were essentially the problems of a too-weak faculty and a too-strong administrator seeking to move the institution too quickly. The sheer rapidity of change possibly was back of the startling $19 billion deficit. If one accepts the reality of this construct, that is, one power valence in the hands of faculty and another in the hands of administration, then it is possible to seek ways by which these two forces can be brought into positions of creative tension. Out of this creative tension could come innovation, but it must be tempered by a knowledge of what innovations the institutions can stand. Through formal organizational assignment of powers, some to the faculty, some to administration, it should be possible to achieve this system of academic checks and balances.

The second principle is that all human beings, including faculty members, are sufficiently venal so that it is possible to purchase interest or to purchase loyalty. Through financial incentives, through incentives of free time, through incentives of perquisites, it is possible to move faculty members from a preoccupation with limited disciplinary concerns to some interest in pedagogy and the broader problems of education.

The third principle is that leadership for innovation and change can be exerted by almost anyone who begins to make the motions of a leader. A person doesn't really need to have a high-sounding title in order to exercise considerable leadership. In its formative years, the University of South Florida maintained a combined position of director of testing and director of institutional research. The first incumbent was a fairly aggressive individual who began to interest himself in a wide range of institutional concerns. The report of a trial visit from the Southern Association during the first year of the university's operation emphasized how much leadership that one officer had achieved. The report stated, "Things are going fine, but we advise you, Mr. President, to have care lest an office such as the office of Testing

and Institutional Research becomes too influential in the institution." The point is that it is possible for a reasonably aggressive person lodged someplace in the institution to become a leader for change simply "by putting the saddle on his own back."

The fourth principle is that improvement requires time. One can speculate that college professors don't teach better than they do because they are inclined to impose on themselves, or have imposed upon them, impossible time schedules. The faculty work load is improving, yet, in junior colleges and a fair number of liberal arts colleges, teaching loads extend from 12 to 15 hours a week divided into four or five courses. These loads may require three different preparations in any given semester, and perhaps six, seven, or eight different preparations over a two-year period, particularly if the institution follows the practice of offering some courses every other year. Given the present rapid rate of increase of knowledge, few college professors are sufficiently intelligent or cosmopolitan to teach five or six different courses at the college level over a two-year period. The sheer struggle to stay abreast of knowledge prevents innovation. Probably in such situations most professors use the two-textbook system, wherein the students are given a poor textbook and the professor bases his lectures on the better textbook. The need for time is really pointed up by faculty reaction to television teaching. Faculty members are sometimes truthful in some of their requests. They will tolerate 12 to 15 hours of class contact and do that teaching, hit or miss, in the face-to-face situation. If, however, the faculty member is expected to perform over closed-circuit television, he wants his work cut in half. The ego really gets involved here. If more people are going to see him, he wants more time to prepare. If he is to teach an open-circuit television class, he wants his full load to consist of just one course so that he can do the adequate job of professional preparation which is required. The point clearly is that if an institution wants innovation, change and improvement, time must be provided.

Repeatedly in this discussion have been mentioned financial considerations. This leads to still another principle, which is that innovation is likely to be encouraged if the institution develops a sufficiently refined system of cost accounting so that actual costs of instruction, as presently performed, can be revealed. If instructors could be shown the high cost to themselves personally of the small, inefficient courses taught by lecture techniques, one can speculate that changes in the curriculum would come about quickly. If cost accounting could show economies from the use of independent study, from television, or from some of the other

innovations which have been discussed, faculties would likely be more susceptible to them.

The sixth and last principle is based on an assumption that many faculty people are threatened and insecure individuals. Change is threatening, and an insecure person reacts defensively to threats. In some way or other, the officer or agency for change must build into the planning a provision for alleviating faculty anxiety and insecurity. It is almost possible to argue that this is so significant that institutions could well provide psychiatric services for faculty members, chargeable as a legitimate expense to the instructional budget. If a faculty person is relatively tranquil within himself, he can be expected to be relatively tranquil in examining a revolutionary new idea. If, on the other hand, he is anxiety-ridden and concerned about his status, he will reject anything which may change his status.

Clearly, all of these are suggestions based upon limited experience. Broader theoretical formulations are needed, as well as more experiments and field testing. Hopefully, some of the new centers for improvement of teaching will attempt some of this.

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